What Works Clearinghouse



Early Childhood Education December 28, 2006

Phonological Awareness Training plus Letter Knowledge Training

Practice description

Phonological Awareness Training plus Letter Knowledge Training is a general practice aimed at enhancing young children's phonological awareness, print awareness, and early reading abilities. Phonological awareness, the ability to detect or manipulate the sounds in words independent of meaning, is a precursor to reading. Phonological awareness training without letter knowledge training can involve various training activities that focus on teaching children to identify, detect, delete, segment, or blend segments of spoken words (i.e., words, syllables, onsets and rimes,

phonemes) or that focus on teaching children to detect, identify, or produce rhyme or alliteration. The added letter knowledge training component includes teaching children the letters of the alphabet and making an explicit link between letters and sounds. Both skills are related to beginning reading. Three related What Works Clearinghouse (WWC) intervention reports review two curricula for phonological awareness—DaisyQuest and Sound Foundations—and a similar practice—Phonological Awareness Training without letter knowledge training.

Research

One study of *Phonological Awareness Training plus Letter Knowledge Training* met the WWC evidence standards and two studies met WWC evidence standards with reservations.¹ Together, these three studies included more than 230 preschool children from upstate New York, two Midwestern communities, and another unidentified state. They examined intervention effects on

children's oral language, print knowledge, phonological processing, early reading/writing, and cognition. Most of the children studied were from economically disadvantaged backgrounds, and about one-fourth of the children were raised in non-English-speaking families. This report focuses on immediate posttest findings to determine the effectiveness of the intervention.²

Effectiveness

Phonological Awareness Training plus Letter Knowledge Training was found to have potentially negative effects on oral language, positive effects on print knowledge, potentially positive effects on phonological processing and early reading/writing, and no discernible effects on cognition.

^{1.} To be eligible for the WWC's review, the Early Childhood Education (ECE) interventions had to be implemented in English in center-based settings with children ages 3 to 5 or in preschool.

^{2.} The evidence presented in this report is based on available research. Findings and conclusions may change as new research becomes available.

	Oral language	Print knowledge	Phonological processing	writing	Cognition	Math
Rating of effectiveness	Potentially negative effects ³	Positive effects	Potentially positive effects	Potentially positive effects	No discernible effects	N/A
Improvement index ⁴	ŭ	Average: +27 percentile points Range: +4 to +40 percentile points	Range: +1 to +50	· ·	· ·	N/A

Additional practice information

Developer and contact

Phonological Awareness Training plus Letter Knowledge Training is a practice that does not have a single developer responsible for providing information or materials. The interventions described in this report were developed by the study authors and are not available for distribution through a common developer. Readers interested in using Phonological Awareness Training plus Letter Knowledge Training practices in their classroom can refer to sources available through internet searches for information. A list of examples follows which has not been reviewed or endorsed by the WWC:

- Phonological Awareness: Instructional and Assessment Guidelines: http://www.ldonline.org/article/6254.
- Ideas and Activities for Developing Phonological Awareness Skills: A Teacher Resource Supplement to the Virginia Early Intervention Reading Initiative: http://www.pen.k12.va.us/VDOE/Instruction/Reading/findings.pdf.
- Reading Rockets: Teacher Toolbox—Phonological Awareness:
 The Phive Phones of Reading: http://www.readingrockets.org/firstyear/fyt.php?SUB=33.

- Reading Rockets: Problems Involving Phonological and Phonemic Awareness: http://www.readingrockets.org/helping/target/phonologicalphonemic.
- Phonological Awareness Skills and Spelling Skills: http://cla.calpoly.edu/~jrubba/phon/phonaware.html.
- Vaughn Gross Center for Reading and Language Arts, University of Texas at Austin: http://www.texasreading.org/utcrla/materials/primary_phono-awareness.asp.
- Phonological Awareness and Reading Recovery: http://www.readingrecovery.org/sections/reading/phonics.asp.
- Improving Reading Fluency: Phonological Awareness Training: http://www.speechpathology.com/Articles/article_detail.asp?article_id=68.
- Florida Center for Reading Research: http://www.fcrr.org.
- University of Oregon: http://www.reading.uoregon.edu.
- National Reading Panel: http://www.nationalreadingpanel.org.
- State Center for Early Childhood Development: http://www.uth.tmc.edu/circle/letter_know.htm.
- PBS: http://pbskids.org/lions/parentsteachers/program/curriculum/letter.html.
- Philadelphia Public Schools Head Start: http://www.lakeshorelearningsolutions.com/philly3.html.

^{3.} The rating of a potentially negative effect for the oral language domain is most likely due to the comparison condition in Roberts and Neal (2004), which focused on increasing children's vocabulary and language comprehension. It would be expected to have a greater impact on oral language than would letter-rhyme training, which is not intended to impact children's vocabulary or language comprehension skills.

^{4.} These numbers show the average and range of improvement indices for all findings across the studies.

Additional practice information *(continued)*

- Southwest Educational Development Laboratory: http://www.sedl.org/reading/framework/nonflash/letter.html.
- Kaplan Early Learning Company: http://www.kaplanco.com/store/trans/productDetailForm.asp?CatID=5%7CLT1045%7C

 0&CollID=14905&Max=236&ID=3&Page=1.

Scope of use

Information is not available on the number or demographics of children or centers using these practices.

Teaching

Phonological Awareness Training plus Letter Knowledge Training practices can be used by teachers with individual children or in small or large group settings. These practices generally are used as a supplement to the regular classroom curriculum, and they have been used with specific subpopulations of students, such as children whose primary language is not English or children who are at-risk of later reading difficulties. Phonological awareness training practices vary in their scope and may include

activities such as rhyme detection training (e.g., teachers may engage children in a game involving rhyming words and ask them about which word in a series of three does not sound like the others), blending training (e.g., teachers may say three sounds and teach children how to blend sounds together to make a word), and segmentation training (e.g., teachers may say a short word such as "cat" and teach children how to separate the word into the three sounds that make up the word) at the phoneme, syllable, or word level. Letter knowledge training practices may include activities to learn the names of letters, recognize the correspondence between letters and sounds, and identify letters in print. Both skills are related to beginning reading and may be taught prior to different instructional approaches to teaching reading.⁵

Cost

Information is not available about the costs of teacher training and implementation of *Phonological Awareness Training plus Letter Knowledge Training* practices.

Research

Three studies reviewed by the WWC investigated the effects of *Phonological Awareness Training plus Letter Knowledge Training* practices in center-based settings. One study (Gettinger, 1986) was a randomized controlled trial that met WWC evidence standards. One study (Roberts & Neal, 2004⁶) was a randomized controlled trial that met WWC evidence standards with reservations because of high overall and differential attrition. One study (Pietrangelo, 1999) was a quasi-experimental design that met WWC evidence standards with reservations.

Met evidence standards

Gettinger (1986) included 72 four- and five-year-old children from preschools located in two Midwestern communities. Sixty-six percent of the children were white, 22% were black, and 12% were Hispanic. Forty-four percent of the children were female, and a range of socioeconomic status levels was represented. Gettinger compared print knowledge and phonological processing outcomes for children participating in an early literacy reading skills training program that included instruction in phonological awareness and letter knowledge training with outcomes for children participating in training in other skills

^{5.} Readers who are unfamiliar with the terminology related to *Phonological Awareness Training* and the development of reading may find it helpful to consult the glossary of terms available from the National Institute for Literacy (http://www.nifl.gov/partnershipforreading/glossary.html) and the definitions of outcome measures in Appendices A2.1–A2.5.

^{6.} Roberts (2003) reported on a subsample from Roberts and Neal (2004) and was reviewed along with that study.

Research (continued)

unrelated to phonological awareness and letter knowledge. Gettinger also reported the effects of the skills training program on early reading/writing outcomes for the same children, all of whom (intervention and comparison group children) were participating in different approaches to teaching reading (i.e., sight word, linguistics, or phonetics) after the initial skills training program for intervention group children had ended.

Met evidence standards with reservations

Roberts and Neal (2004) included 33 three- and four-year-old children from low-income families whose primary language was either Hmong or Spanish. All children were attending a half-day, state-funded preschool. Roberts and Neal compared oral language, print knowledge, phonological processing, and early reading/writing outcomes for children participating in a phonological awareness and letter knowledge intervention group (i.e., letter-rhyme group) with outcomes for children participating in a language comprehension intervention.

Pietrangelo (1999) included 124 four-year-old low-income children who attended 10 Head Start classrooms in upstate New York. Eighty-three percent of the treatment and comparison children came from English-speaking families, while 17% resided with non-English-speaking families. Twenty-nine percent of the children were black, 22% were Hispanic or Latino, 42% were white, and 7% were Asian. Forty-eight percent of the children were female. Pietrangelo compared oral language, print knowledge, phonological processing, early reading/writing, and cognition outcomes for children participating in a supplemental early literacy skills program that focused on teaching phonological awareness skills and letter knowledge with outcomes for children participating only in their regular Head Start curriculum.

Effectiveness

Findings

The WWC review of interventions for early childhood education addresses children's outcomes in six domains: oral language, print knowledge, phonological processing, early reading/writing, cognition, and math.⁷

Oral language. Two studies examined outcomes in the domain of oral language. One study showed statistically significant and negative effects, and one study showed indeterminate effects.

Roberts and Neal (2004) reported findings for two outcome measures in the oral language domain. One of the findings was statistically significant favoring children in the comparison group on a measure of vocabulary,8 and the WWC confirmed the statistical significance of this effect. The study author did not

find a statistically significant difference on a measure of story event sequencing. According to WWC criteria, the effect on story event sequencing was statistically significant and negative when contrasted with the comparison group, which received a language comprehension intervention. The finding of a statistically significant and negative effect for *Phonological Awareness* Training plus Letter Knowledge Training in this study was most likely due to the nature of the comparison condition used, rather than an effect of the Phonological Awareness Training plus Letter Knowledge Training intervention. The language comprehension intervention used as the comparison condition in this study focused on increasing children's vocabulary and language comprehension. Consequently, the comparison condition would

^{7.} The level of statistical significance was reported by the study authors or, where necessary, calculated by the WWC to correct for clustering within classrooms or schools and for multiple comparisons. For an explanation about the clustering correction, see the WWC Tutorial on Mismatch. See Technical Details of WWC-Conducted Computations for the formulas the WWC used to calculate the statistical significance. In the case of Phonological Awareness Training plus Letter Knowledge Training, corrections for clustering and multiple comparisons were needed.

^{8.} Roberts and Neal (2004) also assessed children's English oral language proficiency with a standardized test called the Pre-Idea Proficiency Test. The WWC does not include the Pre-Idea Proficiency Test in the report because it was not intended to measure the effects of the intervention.

Effectiveness (continued)

be expected to have a greater impact on children's oral language skills than would letter-rhyme training, which was not intended to increase children's vocabulary and language comprehension skills. Pietrangelo (1999) found no statistically significant difference between the intervention group and the comparison group on a measure of receptive vocabulary. In this study, the effect was indeterminate, according to WWC criteria.

Print knowledge. Three studies examined outcomes in the domain of print knowledge. Two studies showed statistically significant and positive effects, and one study showed indeterminate effects.

Gettinger (1986) found a statistically significant difference favoring the intervention group on a measure assessing children's knowledge of the names of consonants, and the WWC confirmed the statistical significance of this effect. In this study, the effect was statistically significant and positive, according to WWC criteria. Roberts and Neal (2004) reported a statistically significant difference favoring the intervention group on a measure assessing children's knowledge of letter names, 9 and the WWC confirmed the statistical significance of this effect. In this study, the effect was statistically significant and positive, according to WWC criteria. Pietrangelo (1999) examined four print knowledge outcome measures and found no statistically significant differences between the intervention group and the comparison group. In this study, the effect was indeterminate, according to WWC criteria.

Phonological processing. Three studies examined outcomes in the domain of phonological processing. One study showed statistically significant and positive effects, one study showed substantively important and positive effects, and one study showed indeterminate effects.

Gettinger (1986) reported statistically significant differences favoring the intervention group on three phonological processing outcomes, and the statistical significance of these effects was

confirmed by the WWC. In this study, the effect was statistically significant and positive, according to WWC criteria. Roberts and Neal (2004) found no statistically significant difference between the intervention group and the comparison group on a phonological processing outcome (rhyme production), and the effect was not large enough to be considered substantively important by WWC criteria. In this study, the effect was indeterminate, according to WWC criteria. Pietrangelo (1999) examined the effect of the intervention on three phonological processing outcomes and found statistically significant differences favoring the intervention group on each measure. The WWC was unable to confirm the statistical significance of these effects; however, the findings were large enough to categorize the effect as substantively important and positive, according to WWC criteria.

Early reading/writing. Three studies examined outcomes in the domain of early reading/writing. One study showed statistically significant and positive effects, one study showed substantively important and positive effects, and one study showed indeterminate effects.

Gettinger (1986) reported statistically significant differences favoring the intervention group for four of five measures, and the WWC confirmed the statistical significance of these effects. In this study, the effect was statistically significant and positive, according to WWC criteria. Roberts and Neal (2004) found no statistically significant differences between the intervention group and the comparison group for a measure of writing; however, the finding was large enough to categorize the effect as substantively important and positive, according to WWC criteria. Pietrangelo (1999) did not find statistically significant differences between the intervention group and the comparison group on two early reading/writing outcome measures. In this study, the effect was indeterminate, according to WWC criteria.

Cognition. Pietrangelo (1999) assessed cognition with two outcome measures but did not find statistically significant differences

^{9.} Roberts and Neal (2004) also included a measure of concepts of print. The WWC does not include the measure in this review because it assessed elements of both print knowledge and oral language and it cannot be appropriately placed in either domain.

Effectiveness (continued)

between the intervention group and the comparison group. In this study, the effect was indeterminate, according to WWC criteria.

Rating of effectiveness

The WWC rates the effects of an intervention in a given outcome domain as positive, potentially positive, mixed, no discernible

effects, potentially negative, or negative. The rating of effectiveness takes into account four factors: the quality of the research design, the statistical significance of the findings,⁷ the size of the difference between participants in the intervention condition and the comparison condition, and the consistency in findings across studies (see the <u>WWC Intervention Rating Scheme</u>).

The WWC found Phonological Awareness Training plus Letter Knowledge Training to have potentially negative effects for oral language, 3 positive effects for print knowledge, potentially positive effects for phonological processing and early reading/writing, and no discernible effects for cognition

Improvement index

The WWC computes an improvement index for each individual finding. In addition, within each outcome domain, the WWC computes an average improvement index for each study and an average improvement index across studies (see Technical Details of WWC-Conducted Computations). The improvement index represents the difference between the percentile rank of the average student in the intervention condition versus the percentile rank of the average student in the comparison condition. Unlike the rating of effectiveness, the improvement index is entirely based on the size of the effect, regardless of the statistical significance of the effect, the study design, or the analysis. The improvement index can take on values between -50 and +50, with positive numbers denoting favorable results. The average improvement index for oral language is -12 percentile points across the two studies, with a range of -34 to +4 percentile points across findings. The average improvement index for print knowledge is +27 percentile points across the three studies, with a range of +4 to +40 percentile points across findings. The average improvement index for phonological processing is +28 percentile points across the three

studies, with a range of +1 to +50 percentile points across findings. The average improvement index for early reading/writing is +19 percentile points across the three studies, with a range of -2 to +39 percentile points across findings. The average improvement index for cognition is +4 percentile points for one study, with a range of +2 to +7 percentile points across findings within the study.

Summary

The WWC reviewed three studies on *Phonological Awareness Training plus Letter Knowledge Training.* One of these studies met WWC evidence standards, and two studies met WWC evidence standards with reservations. Based on these three studies, the WWC found positive effects for print knowledge, potentially positive effects for phonological processing and early reading/writing, and no discernible effects for cognition. The WWC also found a potentially negative effect for oral language; however, this finding is likely the result of the comparison group used in one of the studies and not a general result of the intervention. The evidence presented in this report may change as new research emerges.

References

Met WWC evidence standards

Gettinger, M. (1986). Prereading skills and achievement under three approaches to teaching word recognition. *Journal of* Research and Development in Education, 19(2), 1–9.

Met WWC evidence standards with reservations

Pietrangelo, D. J. (1999). Outcomes of an enhanced literacy curriculum on the emergent literacy skills of Head Start preschoolers. *Dissertation Abstracts International*, 60(4), 1014A. (UMI No. 9927614).

Roberts, T., & Neal, H. (2004). Relationships among preschool English language learners' oral proficiency in English, instructional experience and literacy development. *Contemporary Educational Psychology*, 29(3), 283–311.

Additional source:

Roberts, T. A. (2003). Effects of alphabet-letter instruction on young children's word recognition. *Journal of Educational Psychology*, 95(1), 41–51.

For more information about specific studies and WWC calculations, please see the <u>WWC Phonological</u>

Awareness Training plus Letter Knowledge Training Technical Appendices.